

CLAIMS

1. A resistance assembly for use in an exercise machine which includes an elongate first cylinder with a first cross sectional area, an interior of the first cylinder, in use, being pressurised with a gas, an elongate member with a first end and a second end, the elongate member extending partly into the interior of the first cylinder with the first end inside the first cylinder and the second end outside the first cylinder, the elongate member being mounted for reciprocating movement, in its longitudinal direction, relatively to the first cylinder, the elongate member upon being moved by a distance ℓ into the interior of the first cylinder displacing a volume of gas which is given by the expression $\ell \times a$ where a is a second cross sectional area which is smaller than the first cross sectional area, and a formation at a location selected from a position on the elongate member which is outside the first cylinder and a position on the first cylinder for connection to an actuator whereby a user can cause movement of the elongate member relatively to the first cylinder.
2. A resistance assembly according to claim 1 which includes apparatus for pressurizing the interior of the first cylinder with a gas.
3. A resistance assembly according to claim 1 wherein the elongate member is tubular with a hollow interior and the first end is open and in

communication with the interior of the first cylinder, and the second end is sealed.

4. A resistance assembly according to claim 3 wherein the cross sectional area of the hollow interior is equal to the second cross sectional area.
5. A resistance assembly according to claim 1 wherein the elongate member has a cross sectional area which is equal to the second cross sectional area.
6. A resistance assembly according to claim 5 wherein the elongate member is solid.
7. A resistance assembly according to claim 1 which includes a piston head, with inner and outer sides, which is fixed to the first end of the elongate member and which is engageable with an internal surface of the first cylinder and which acts to guide the reciprocating movement of the elongate element and wherein, within the interior of the first cylinder, the pressure of the gas on the inner side of the piston head is the same as the pressure of the gas on the outer side of the piston head.
8. A resistance assembly according to claim 7 wherein the piston head includes at least one formation which allows for free movement of gas, inside the interior of the first cylinder, between the inner side of the piston head and the outer side of the piston head.

9. A resistance assembly according to claim 8 wherein the at least one formation is a passage in the piston head between the inner side and the outer side thereof.
10. A resistance assembly according to claim 1 which includes a second cylinder which is located at least partly within the first cylinder and which includes an inner end through which at least part of an interior of the second cylinder is placed in gas communication with the interior of the first cylinder and an outer end, the elongate member extending partly into the second cylinder with the first end of the elongate member inside the second cylinder and the second end of the elongate member extending from the outer end of the second cylinder, the reciprocating movement of the elongate member taking place inside the second cylinder, and a piston head at the first end of the elongate member which is in sealing and reciprocating contact with an opposed inner surface of the second cylinder.
11. A resistance assembly according to claim 1 wherein the size of the first cross sectional area is at least six times the size of the second cross sectional area.